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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,074	12/09/2003	Chung-Hsien Lee	LEEC3080/EM	2762

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EXAMINER

CHAU, COREY P

ART UNIT PAPER NUMBER

2644

DATE MAILED: 12/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/730,074

Applicant(s)

LEE, CHUNG-HSIEN

Examiner

Corey P Chau

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12/09/2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being obvious over Applicant's admitted prior art in view of U.S Patent No. 5539741 to Barraclough et al. (hereafter as Barraclough).

3. Regarding Claim 1, Applicant's admitted prior art discloses a device for synthetic audio processing, which inputs an audio wave and performs modulation for outputting a synthetic audio, comprising a modulation circuit, a controller, an output circuit, wherein the output circuit receives the audio wave and modulates it based on characteristic parameters, to output the audio L and R. The characteristic parameters include mute parameter Mute, volume control parameter VoCol, channel control parameter ChCol, left selection parameter L-Col and right selection parameter R-Col. The parameter Mute determines whether or not each audio wave is outputted. The parameter VoCol adjusts current volume of an audio wave. The parameter ChCol determines if the audio wave is output. The parameters L-Col and R-Col control an output ratio of left to right channels of the audio wave. Finally, the left audio L and another left audio L' generated by the output circuits of another channels are added, and similarly the right audio R and another right audio R' are added, thus generating and outputting the synthetic audio.

Art Unit: 2644

However, the cited audio synthesis processing needs a lot of multipliers to do multiplication. For example, the cited Mute, VoCol, ChCol, L-Col and R-Col parameters of the output circuit require doing multiplication to obtain corresponding functions, and thus it takes lots of time. In addition, the cited multipliers are complicated and occupy a large circuit area. This causes that required area and power consumption for an audio synthesis circuit cannot be reduced any more. Therefore it is obvious to one having ordinary skill in the art to change the multiplication with logarithmic addition, which for most processor is computationally less expensive than multiplication, as taught by Barraclough. Barraclough discloses the logarithm of a weighting parameter (i.e. related gain value) could be obtained from a look-up table (i.e. a wave-gain look-up table, to store voltages  $S_i$  of the audio wave and related gain values  $Y_i$ , where  $Y_i = k \cdot \log S_i$  and  $k$  is a constant). Therefore using the look-up table to convert the audio wave into related gain values (i.e. weighting parameter) and to add the gain values and a modulating gain value (i.e. the multipliers has been replace with adder) this output a synthetic gain value. Then the synthetic gain value is then converted back into linear scale (i.e. inverse conversion circuit, to convert the synthetic gain-value into the synthetic audio based on the wave-gain look-up table (Fig. 6; column 8, lines 18-53).

4. Regarding Claim 2, Applicant's admitted prior art as modified discloses the at least one adder is an adder that adds the audio gain values and a mute modulating gain value (Fig. 1).

5. Regarding Claim 3, Applicant's admitted prior art as modified discloses the at least one adder further includes an adder that adds the audio gain values and a volume control modulating gain value (Fig. 1).
6. Regarding Claim 4, Applicant's admitted prior art as modified discloses the at least one adder further includes an adder that adds the audio gain values and a channel control modulating gain value (Fig. 1).
7. Regarding Claim 5, Applicant's admitted prior art as modified discloses the at least one adder further includes an adder that adds the audio gain values and a left selection modulating gain value (Fig. 1).
8. Regarding Claim 6, Applicant's admitted prior art as modified discloses the at least one adder further includes an adder that adds the audio gain values and a right selection modulating gain value (Fig. 1).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey P Chau whose telephone number is (703)305-0683. The examiner can normally be reached on Monday - Friday 9:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

December 13, 2004



**FORESTER W. ISEN**  
**SUPERVISORY PATENT EXAMINER**